

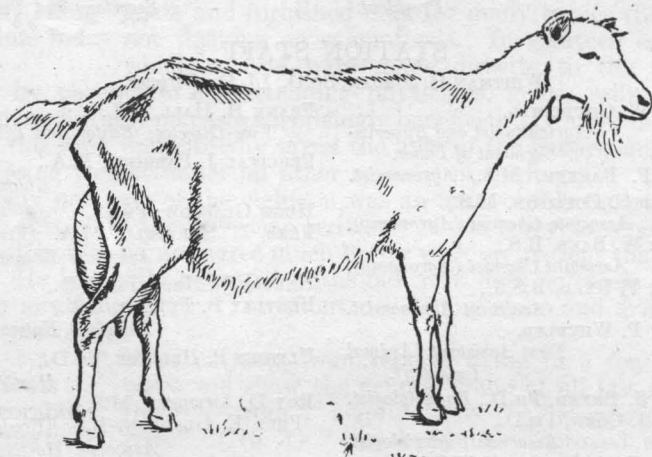
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New York Agricultural Experiment Station.

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SAANEN DOE, No. 11.

GOAT MILK GOOD FOR BABIES

SUMMARIZED BY
F. H. HALL
FROM BULLETIN BY
W. H. JORDAN AND G. A. SMITH

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*Connected with Grape Culture Investigations.

POPULAR EDITION *

OF

BULLETIN No. 429.

GOAT MILK GOOD FOR BABIES.

F. H. HALL.

**Many ailing
infants fed.**

For several years the Station maintained a herd of goats and furnished milk for many babies that were not thriving on other foods. In eighteen cases on which reports were made directly to the Station either by parents or by attending physicians, goat's milk proved helpful, and in several cases surprisingly beneficial. In a few instances use of this milk undoubtedly saved the lives of the babies, since they were losing weight under all other systems of feeding.

In only one case of the eighteen was an unfavorable report made; and of this child the physician writes: "I am sorry to report that the goat's milk did not agree much better with my patient than cow's milk. He is a child twenty months old, who does not seem able to absorb anything . . . without developing signs and symptoms of fat poisoning."

**Some
favorable
reports.**

Brief extracts from reports made in a few of the cases will show the general trend of all but the one report — from "helpful" to "a wonderful success." (No. 1) "Our baby has improved wonderfully on it. . . . We tried everything we could find for him but nothing would agree with him until we got the goat's milk." (No. 3) "Baby had been troubled with constipation and with vomiting. We started on the goat's milk . . . and conditions greatly improved." (No. 6) "The child was six months old, weighed eight pounds, and in a very scrawny condition. . . . For the sixteen weeks the child was fed goat's milk it averaged five-eighths of a pound per week gain." (No. 10) "It is a very great pleasure for me to tell you that the goat's milk which you furnished us for the past three weeks has worked wonders." (No. 15) "The results thus far are very gratifying, I assure you, for we had used almost everything, and had despaired of saving her at all." In two months before feeding the goat's milk this child had lost three-fourths of a pound in weight; in the first week of feeding she

* This is a brief review of Bulletin No. 429 of this Station, on Goat's Milk for Infant Feeding, by W. H. Jordan and G. A. Smith. Anyone specially interested in the detailed account of the investigations will be furnished, on application, with a copy of the complete edition. Names of those who so request will be placed on the Station mailing list to receive future bulletins, popular or complete edition as desired.

gained one-half pound, and in the next week a full pound. (No. 16) "He has been under the care of a famous baby specialist for weeks but with no results. [After beginning use of goat's milk] he began to improve at once, gaining from four to ten ounces a week." Even tho this evidence is not, in most cases, the result of the professional judgment of physicians, it is so marked that it cannot be disregarded. It apparently shows clearly that goat's milk is often a very desirable resort for infant feeding.

**Goat's milk
used in
hospital.**

The Station also furnished goat milk for an extensive series of tests at St. Mary's Infant Asylum and Maternity Hospital, Buffalo, N. Y., under the supervision of Drs. Sherman and Lohnes; but the results were not so definitely favorable as the individual cases reported. The study was made, specifically, to ascertain "why goat's milk agrees better with some infants than cow's milk," the fact that it does so act being assumed. Stomach and intestinal troubles due to streptococcic infection, and removal of infants from the hospital by adoption, as well as conditions affecting institution babies generally, interfered somewhat with the success of the experiment. Of sixteen cases carried thru to a definite conclusion, it was found that goat's milk agreed better with four babies only, cow's milk better with twelve cases; but the gain was more rapid and greater in the individual cases where goat's milk was preferred than in those where the cow's milk was better. Physical and chemical examinations of the partly digested stomach contents, stools, etc., proved that the curds were smaller and more flocculent, the stomach acidity less, and the amount of undigested food remaining in the stomach after an hour's time less with goat's milk than with cow's milk. These factors help to explain the beneficial action of goat's milk in some cases of vomiting; since the goat's milk stimulates less the secretion of acid by the stomach, produces smaller curds and is more rapidly digested than the cow's milk.

It was also noted that the younger the baby the more the evidence pointed toward a greater gain on goat's milk.

**Goat's milk,
cow's milk
and
human milk.**

Chemical studies made in the Station laboratory showed some marked differences between goat's milk, cow's milk and human milk, but the differences do not at present furnish an explanation of the apparently better adaptation of goat's milk, in many instances, to human feeding, when a substitute for human milk must be used.

**Station
goat herd.**

The Station came into the possession of the herd of goats here discussed, unexpectedly, thru their presentation by Mr. H. S. Greims, of New York City. As received, the goats were a mixed lot, of various breeds and no breeds, some very good and some very poor; but after two years of weeding out, with several deaths from a rather uncom-

mon disease known as Takosis, they were reduced in 1912 to three mature males, twenty-eight females and nine kids: One full-blood Saanen, two Schwartzbergs and five Toggenbergs, with full-blood or half-blood descendants from the original animals, some of the crosses containing Angora and American milch-goat blood.

These thirty-one animals were fed experimentally from January 14, 1912, to January 13, 1913, and as careful a record as possible was kept of the feed consumed. It was impossible to secure accurate data on the expenses of maintaining the goats other than for food even under Station conditions; and it is understood that one of the reasons for relinquishing the herd by Mr. Greims was because he could not secure accurate data, as he at first hoped to do. Because of the number of the animals and their uncontrollable, wasteful eating habits it was impossible to keep a detailed account of the food eaten by each one; but so far as could be observed there was little difference between individuals in the consumption of coarse feed. About a pound a day of grain was given each mature animal. The table below gives the essential data relating to the feed eaten.

TABLE I.—AMOUNT AND COST OF FEED FOR MILCH GOATS

(Adult males, 3; adult females, 28; kids, 9.)

For Year 1912.

	Days fed.	Amount used.	Cost per 100 pounds.	Total cost.
		<i>Lbs.</i>		
Grain	365	14,688	\$1 45	\$212 96
Bean pods	199	18,180	35	63 63
Beets, mangel	46	1,550	20	3 11
Hay, mixed	273	19,560	50	97 80
Grass	122	24 300	15	36 45
Pasture	132	28 00
Total	\$441 95

The monthly cost of food varied considerably with the season, averaging about one dollar apiece from September thru January, and from 80 cents to 96 cents for the other months, the lowest figure being for July.

Milk yield. For three years accurate records were kept of the milk production of individual does, their breed and milk production being as follows:

TABLE II.—MILK YIELD OF MILCH GOATS.

			MILK YIELD		
			1910	1911	1912
			Lbs.	Lbs.	Lbs.
No. 5.	Full blood	Schwartzenberg	678.3	913.3	600.7
No. 6.	"	Short Haired Toggenberg	778.4	1,455.7	377.1
No. 7.	"	"	186.5	763.5	870.7
No. 8.	"	"	1,189	838.3	*
No. 9.	"	Long	210.3	1,167.1	705.5
No. 10.	"	Short	†	1,361.4	869.2
No. 11.	"	Saanen	1,028.5	1,845.2	1,391.1
No. 12.	"	Schwartzenberg	120.5	613	424
No. 15.	Toggenberg-Angora		496.5	801.3	725.5
No. 16.	"	"	457	899.4	655.9
No. 17.	"	"		211	63.9
1910 kid of No. 5.				846	861
Toggenberg-American				406.5	472
1911 kid of No. 5.					741.2
1911 kid of No. 5's 1910 kid.					†
1911	"	" 6.			428.1
1911	"	" 10.			528.1
1911	"	" 12.			583.2
1911	"	" 16.			336.8
Schwartzenberg-Toggenberg.					409.9
Toggenberg-Saanen					439.1
" "					413.7
" American					489.6
" "					518.8
Saanen-Angora					301.7

It is to be noted that during 1911, the production of four of these animals, Nos. 6, 9, 10 and 11, was very satisfactory. With only one animal did this standard of production continue during 1912, namely, No. 11. This pure bred Saanen appears to have been a somewhat unusual animal, as her milk yield in 1911 was 1845.2 pounds. During 1911 and 1912 several of the animals gave from 700 to 900 pounds of milk, which is perhaps as good a yield as may be expected, excepting from animals considerably above the average. It should be noted that the period of lactation is considerably shorter than with cows, continuing from 250 to 300 days with most of the does.

The average cost of food per goat for the year was \$11.05, making the cost per day three cents. If it was possible to get any number of goats together like No. 11, the Saanen, the keeping of goats would be a profitable proposition for a family supply. On the basis of a food cost of eleven dollars a year, her milk, during the year of best production, would cost 1.27 cents a quart, the average of the three years being 1.65 cents a quart. The best Toggenberg

* Would not breed. † Did not breed. ‡ No milk.

one year produced milk for 1.62 cents a quart, but her average for the three years was 2.70 cents a quart. The average food cost of the milk, for 1912, of all the goats was 4 cents a quart, and the average cost for the three years was 3.4 cents a quart. The average fat content of the milk was 3.71 per ct., of total solids 11.76 per ct. The average food cost of a quart of milk with the Station herd of 25 Jerseys during the past three years has been .92 cents per quart; the average fat content 5.9 per ct., and total solids 15.20 per ct. This shows the cows to be cheaper producers of milk and milk solids than the goats under the conditions prevailing at this Station.

**Composition
of goat's
milk.**

Daily analyses were made of the mixed milk of the goats for seven weeks in May and June, 1912. These showed a milk of quite uniform composition for the herd as a whole, since the fat varied only from 3.2 per ct. to 4.4 per ct., with a marked tendency to remain about 3.5 to 3.8 per ct. Individual goats, however, varied greatly from these figures, as shown by analyses on three successive days of the milk of eleven of the does. In these animals the fat ranged from 6.0, 7.8, 8.4 per ct. for the tests of one animal to 3.0, 2.2, and 1.8 for those of another. The solids-not-fat ranged for the herd from 7.7 per ct. to 8.6 per ct., with a general range between 7.8 per ct. and 8.2 per ct. and extreme variations with separate individuals from 7.0 per ct. to 10.2 per ct.

Conclusions.

As a general summary of Station experience with goats it would seem that only in exceptional cases where the use of otherwise wasted feed would reduce the cost of keeping, or with exceptional animals, like No. 11, could goats be expected to produce milk as economically as cows. For family use, however, in places where it is impossible to keep a cow and where a goat or two could be kept, these animals might prove valuable aids in maintaining babies or small children in good health. The milk is palatable, nutritious and easily digested, very helpful in certain cases of poor nutrition, without odor when drawn under proper conditions and with proper care, and practically free from the liability to transmit certain diseases, like tuberculosis, which may be transferred to children from cows.

The odor from goats is decidedly unpleasant at times, but as this is mainly due to the male, the annoyance from this source may be reduced to a minimum where a few does only are kept under proper conditions.

